

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the present application:

1-43. (Canceled)

44. (Currently amended) A processor comprising:

a plurality of functional units coupled to each other to execute operations defined from an instruction set of the processor, the plurality of functional units including an arithmetic logic unit (ALU) and a multiplier, the instruction set having a hierarchy of instruction levels, each of which can be used by a programmer to define instructions for the processor, the hierarchy of instruction levels including

a RISC/CISC assembly code level,

a second assembly code level which includes a plurality of instructions which are accessible to the programmer and which can explicitly reference individual outputs of any of the plurality of functional units, and

a vector processing assembly code level, using which an individual instruction can be used to cause an operation to be automatically repeated sequentially a programmable number of times on different data words; and

a plurality of control registers, the plurality of hierarchical instruction levels further comprising a fourth level corresponding to the control registers, using which individual instruction words executed by one or more of the functional units can be extended by bits in the control registers on a per-instruction-cycle basis.

45. (Previously presented) A processor as recited in claim 44, wherein the second assembly code level comprises a native machine language of the processor.

46-48. (Canceled)

49. (Previously presented) A processor as recited in claim 44, further comprising:
a plurality of dedicated output buses, one for each of the functional units; and
a plurality of bus registers, each coupled to store the output of only a corresponding one of the plurality of functional units and each coupled to only a corresponding one of the plurality of dedicated output buses.

50. (Previously presented) A processor as recited in claim 49, wherein each of the dedicated output buses is coupled to an input of at least one other of the plurality of functional units.

51-62. (Canceled)

63. (Currently amended) A processor comprising:
a plurality of functional units coupled to each other to execute operations defined from an instruction set of the processor, the plurality of functional units including an arithmetic logic unit (ALU) and a multiplier, the instruction set having a hierarchy of instruction levels, each of which can be used by a programmer to define instructions for the processor, the hierarchy of instruction levels including
a RISC/CISC assembly code level,

a second assembly code level which includes a plurality of instructions which are accessible to the programmer and which can explicitly reference individual outputs of any of the plurality of functional units, wherein the second assembly code level comprises a native machine language of the processor, and

a vector processing assembly code level, using which an individual instruction can be used to cause an operation to be automatically repeated sequentially a programmable number of times on different data words;

a plurality of control registers, the plurality of hierarchical instruction levels further comprising a fourth level corresponding to the special use control registers, by which individual instruction words executed by one or more of the functional units can be extended by bits in the control registers on a per-instruction-cycle basis;

a plurality of dedicated output buses, one for each of the functional units, wherein each of the dedicated output buses is coupled to an input of at least one other of the plurality of functional units; and

a plurality of bus registers, each coupled to store the output of only a corresponding one of the plurality of functional units and each coupled to only a corresponding one of the plurality of dedicated output buses.